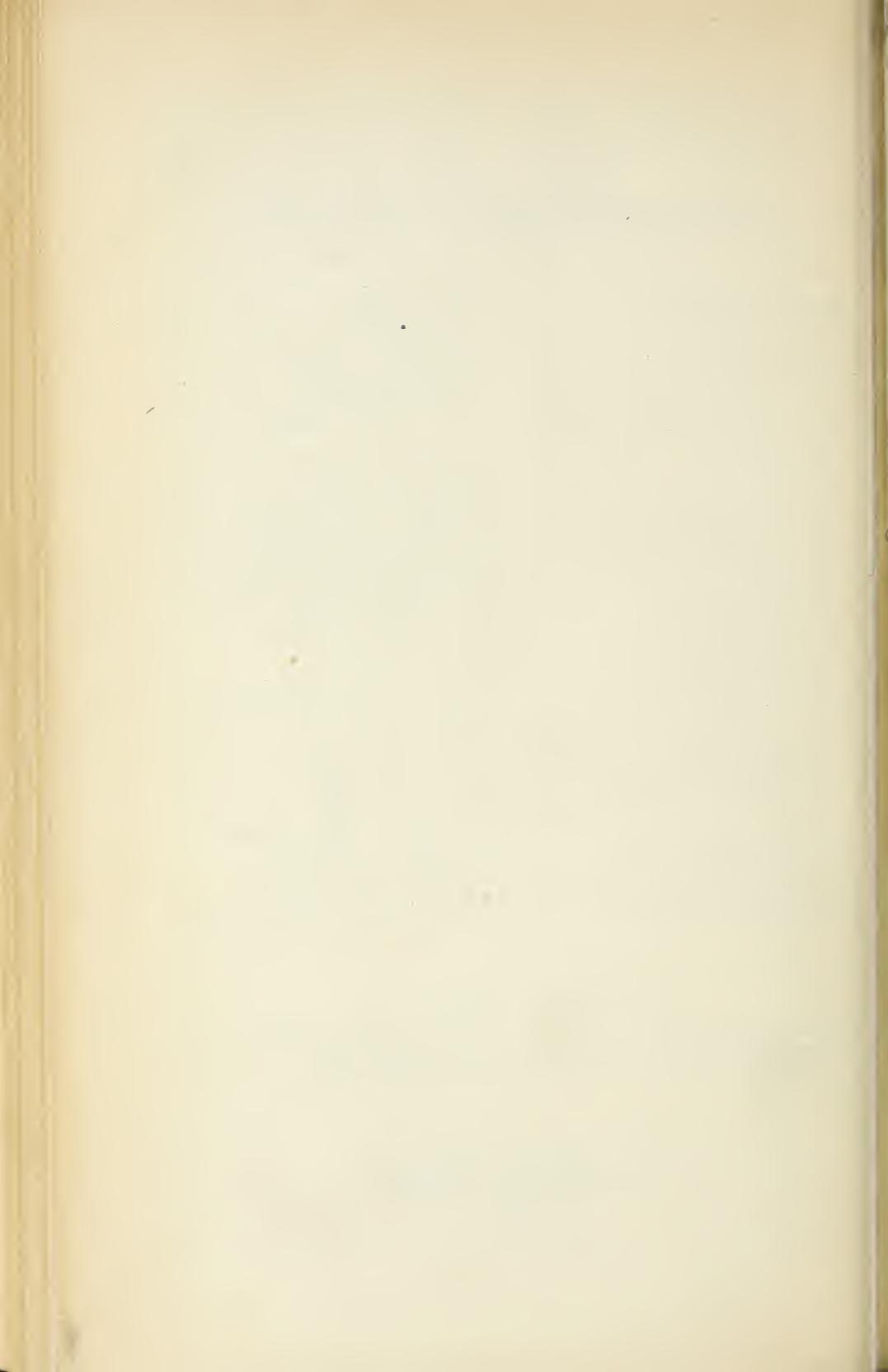


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EXTENSION WORK WITH FRUITS, VEGETABLES, AND ORNAMENTALS, 1923

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MAJOR PROBLEMS

The outstanding problems considered by extension forces in fruit work are concerned with pruning, spraying, fertilizing, and use of orchard cover crops. These problems pertain to both commercial and home fruit production. Extension horticulturists and people generally realize the need for more fruit in the diet, and are either giving old home orchards better care or are planting new home orchards to meet this need. Berries and grapes are also being planted extensively for home use.

Pruning is the most widespread of all fruit operations, and must be continued year after year, because of the new growth made by fruit trees, grapevines, and bush fruits each season. Furthermore, neglected fruit trees, grapevines, and berry bushes must be pruned to get them into condition to

produce fruit of good quality. Experimental and practical fruit-tree pruning has now reached the point where extension horticulturists understand and teach moderate pruning as a means of bringing about early bearing and of keeping trees in good producing condition. (Fig. 1.)

Spraying must be done to control insect and disease pests which would otherwise destroy the major part of fruit crops. Although spray work is complicated by specific remedies for certain diseases and insects, the horticulturists cooperate with the entomologists and pathologists in the dissemination of information on disease and insect control. A special spray service is conducted in some States by extension representatives of the departments of entomology, pathology, and horticulture. Occasionally the United States Weather Bureau has been able to aid in this work. By

means of this spray service thousands of fruit growers are given information through county extension agents as to the proper spray to use and the time of application.

Fertilizing is essential to restore vitality and productive power to fruit trees, grapevines, and berries that are growing on poor soil, and to continue crop yields on rich soils. Cover crops are more necessary than ever to furnish decayed vegetable matter for soil fertility, because stable manure is diminishing in quantity each year.

The outstanding problems in vegetable growing are concerned with dependable sources of seed, maintaining fertility with diminishing manure supply, controlling insects and diseases

characterized by a revival of interest in the home vegetable garden as a major problem.

In ornamental horticulture the improvement of home surroundings and flower growing on the farm for pleasure and profit are the most important lines of work conducted. (Fig. 3.)

SECONDARY PROBLEMS

Secondary problems of fruit work are concerned with budding and grafting; tree, vine, and bush planting; orchard soil management; organizing fruit-packing and selling associations; thinning fruit; peach-borer control; orchard heating; planting 1-acre farm orchards and smaller home orchards;



FIG. 1.—County agent showing proper pruning methods in a Connecticut demonstration orchard. As a result of such demonstrations conducted by county extension agents with the assistance of extension horticulturists, improved methods of pruning fruit trees, bush fruits, and grapevines were used on 90,335 farms in 1923. (Photograph furnished by Connecticut Extension Service)

affecting vegetable crops, standardizing the grade and pack of vegetables, and the home vegetable garden. The most important or outstanding problem in one State may not be the most important in another. On the light sandy soils of the Atlantic coast region the use of soil-building crops and other means of maintaining soil fertility are the most important.

Source of seed supply comes nearer being a major problem universally than any of the others. Standardization of grade and pack and methods of marketing are important problems in all sections where crops are shipped to market. (Fig. 2.) These phases are not so important in States or sections where products are hauled directly to market. The year 1923 was

and fruit-extension schools. These problems are secondary in the sense that they do not cover such large areas as the major problems, although in certain individual States some of them are of major importance.

Secondary problems in vegetable work are similar to those in fruit growing, in that they are often of major importance for a State or section. For example, production of tomatoes for canning is of major importance in certain sections in about 10 States, while certification and use of certified seed potatoes are of major importance in nearly every State. Among strictly secondary problems are use of sulfur to prevent potato scab, staking and pruning of tomatoes, and thinning or pruning of watermelons.

In many cases problems that are of secondary importance one year become of primary importance the following year. This has been true where an industry was being established whose future was more or less uncertain at the beginning.

Secondary problems in ornamental horticulture include improvement of grounds around community buildings, schools, and churches, propagation of plants by cuttings or division, and growing of seeds and bulbs.

FUNDS AND PERSONNEL

During 1923 about \$295,000 was expended by States in extension work with fruits, nuts, vegetables, and

acted as clearing houses in carrying horticultural information from the Department of Agriculture to the States. They gathered up the best things in horticultural extension work in each State and made them available to all other States. They also sent to each State specialist a monthly mimeographed publication known as the *Extension Horticulturist*, which contained special information on subject matter and methods.

DETERMINING THE PROGRAM OF WORK

In general, the program of work is determined in each State in the same manner, although it may vary in detail. In organized communities where



FIG. 2.—County agent demonstrating grading and packing muskmelons on a Maryland farm. (Photograph furnished by Maryland Extension Service)

flowers. There were 37 States with projects using Smith-Lever and State offset funds, 4 States with projects using State funds only, and 7 States not using any funds for horticultural extension work. In all horticultural lines there were 76 State extension horticulturists, most of whom were devoting full time to this work.

In the United States Department of Agriculture there were in 1923 three extension horticulturists, one giving full time and two giving part time to the work. They traveled from State to State, staying from two days to one week with each State extension horticulturist, discussing plans of work, lines of work and methods, and visiting demonstrations throughout the State. These Federal workers

there is a desire for horticultural demonstrations, lines of work are usually adopted by local organizations and passed on by the local committee to the county committee and county agent, who determine which lines are desirable in the different localities. The county agent usually presents these local plans at the State conference of extension workers. The extension horticulturist attends this conference and states on what horticultural subjects the college has information and what matters he is ready to demonstrate. County agents select the demonstrations they need in various counties. Later, the extension horticulturist and county agent draw up their plans and, with or without the county and local committee, select

local demonstrators who are to do certain things according to agreement. The extension horticulturist then gives such demonstrations as are necessary

visitation from the specialists. If the county does not have local associations, then the extension horticulturist and county agent decide upon the lines



FIG. 3.—A farmstead that was improved in four years through the help of the landscape extension horticulturist. Reports indicate that extension agents, with the assistance of extension horticulturists, conducted approximately 36,000 adult and junior demonstrations in beautifying home grounds in 1923, with the result that better practices were adopted in approximately 47,500 homes

and endeavors to train the county agent and demonstrators so that they may carry on the work in the county throughout the season without further

of work most needed and select demonstrators.

In counties without a county extension agent, groups of men or women

often ask for demonstrations, and if the demonstrations are given the extension horticulturist naturally works directly with these groups. The tendency now is for the extension horticulturist to train county agents, committeemen, and demonstrators as leaders to do the actual demonstrating. Thus he may spend more of his time in training new leaders and less in personally conducting demonstrations.

Most college subject-matter departments assist in determining which lines of research have been carried far enough to be considered ready for demonstration, and also what general empirical practices may be profitably extended.

In many States results accomplished in home-ground improvement have evolved from a well-planned program leading to the point where there is a demand that farm life be made more pleasant as well as more profitable. The planting about schools and churches is the result of an awakened civic consciousness that desires to express itself in a better appearance. Flower growing was first undertaken to provide a profitable source of income for the farm woman in addition to poultry, butter making, and canning. It was also thought to be a desirable adjunct to club work of other kinds, such as sewing clubs and canning clubs.

CIRCUMSTANCES DETERMINING THE TYPE OF TREATMENT

The extension horticulturist's judgment is called into action in determining the most practicable way of handling commercial fruit-growing demonstrations as compared with home fruit-growing demonstrations, because of the difference in the size of the units. In commercial fruit-growing demonstrations, for instance, a complete schedule of spraying, whether it be three or more applications, must be made, because the annual income depends on the proportion of high-grade fruit produced. In the home orchard the fruit crop is secondary to other crops, and the number of spraying applications given must be consistent with reasonable pest control and what the farmer can be induced to apply himself or hire someone to do. It may not be the full commercial schedule, but it is the best that can be obtained under the circumstances. The extension horticulturist must govern his recommendations by what those he is aiming to help can and will do.

In certain Southern States extension horticulturists are providing working plans for the planting and care of orchards and large trucking enterprises. This supervision or suggestive direction is given in most cases in the presence of the county agent; or, when it is given in writing, the county agent is furnished with a copy. In this manner the whole enterprise becomes a demonstration of the principles and teachings of the extension service.

USE OF DEMONSTRATIONS TO SPREAD INFLUENCE

An orchard tour is the most effective means of acquainting people with the results of a spraying or other orchard demonstration, because they can see just what has been accomplished. The tour is followed later by exhibits in show windows and fairs, meetings, addresses, circular letters, and perhaps personal letters and printed matter to keep before orchard owners the fact that they can produce a crop of good fruit by spraying, and that spraying demonstrations will be given at designated places on certain dates. The extension horticulturist arranges or assists county agents in arranging with druggists, seedsmen, or wholesale houses for supplies of spraying materials to be sold to farmers at reasonable rates. An automobile tour to spray-ring orchards is the best aid to extension horticulturists in forming new spray rings. They need only to show the increased yield and growth of fruit trees in a fertilizer demonstration to induce people to use fertilizers.

Extension horticulturists in vegetable work have found the field meeting and tour the most effective method of spreading results of demonstrations. Circular letters, publications, and articles in local and State-wide papers have also been effective in getting the idea before growers. Signboards calling attention to the location, scope, and results of demonstrations have also been effective (fig. 4).

In several States major demonstrations in landscape gardening are handled in such close relation between extension horticulturists and county extension agents as to influence directly the teaching of these agents. In one State half the counties have major demonstrations under way, and such demonstrations are eventually to be carried into every county where there is an extension agent. Another

State is putting in demonstrations in those communities desiring to improve the surroundings of one or two semi-public buildings and where at least two farm families are willing to carry out demonstrations. In this State county agents have had special training along these lines for several years.

MEETINGS, INSTITUTES, AND SCHOOLS

Various kinds of meetings, extension schools, institutes, tours, and the like are used by extension horticulturists to meet special needs. In a commercial fruit-growing section the extension school of two to six days is perhaps best, because there is time to do considerable training of fruit growers along two or three special

work, such as pruning, spraying, fertilizing, cultivating, and fruit thinning.

As a means of spreading influence, there is nothing to equal automobile tours. Such tours are usually held in the summer and fall, when results of demonstrations are evident, but sometimes they are held in the spring, as orchard-pruning tours. They have been popular and most effective in teaching the pruning of fruit trees of different ages and sizes under different growing conditions.

A very remarkable orchard tour in Indiana, lasting three days and participated in by about 300 people, was organized by the county agent and the extension horticulturist. These two men worked out the following details of the tour: Dates and assembling



FIG. 4.—Roadside sign calling attention to a sweetpotato variety demonstration. The use of such signs has been found an effective means of extending the influence of demonstrations. (Photograph furnished by New Jersey Extension Service)

lines. One-day or two-day institutes are not so effective because of the shorter time, and fruit subjects are often on the program where there are practically no fruit interests and no time is available to work up interest. Short courses are usually held at colleges and are mostly of a subject-matter nature. Not only extension horticulturists but members of the college teaching staff and practical fruit growers give lectures at these courses. All extension horticulturists use field meetings for all kinds of demonstration work throughout the entire season (fig. 5). In fact, without field meetings fruit demonstrations could not be conducted successfully. At these meetings county extension agents, county committeemen, and demonstrators are trained in all kinds of fruit

point: orchards to be visited and things to be observed in those orchards, with the speakers to explain special points of interest in each orchard; the itinerary of orchards and roads to use in reaching them; the schedule of time in each orchard; the noon meeting place for lunch each day; speakers for noon and evening meetings; the time of reaching places for spending the night, and places and hotels for night stops.

The tour started with an evening meeting at which the county extension agent in charge announced the details of the trip. The crowd was divided into four groups and a leader selected for each group. Each group leader was given a horn for obtaining attention and a stick for indicating directions. The itinerary of each group

was mapped out for the next day; and mimeographed sheets giving information on roads, orchards, stopping places, points of interest, and everything pertaining to the trip were distributed. Each group had its distinct itinerary, and no two groups met at any orchard, yet all four groups visited every orchard.

The next morning each leader headed his group, and the day's schedule began. At each orchard either the owner or one of the horticultural men from Purdue University explained the

test, conducted by the extension forces of Mississippi. The object of the contest was to stimulate production of fresh vegetables in home gardens throughout the entire year. The project was conducted by the extension horticulturist and was carried into effect through the home demonstration agents with the women's clubs and similar organizations co-operating.

In each county where work was undertaken the home demonstration agent arranged for cooperation of the



FIG. 5.—Extension workers demonstrating the use of small garden tractors at a field meeting. More than 37,000 adult demonstrations in home vegetable gardening were completed during 1923 through the efforts of county extension agents, with the result that better practices in gardening were adopted in 89,156 homes. (Photograph furnished by New Jersey Extension Service)

demonstration work and other things of interest. On the instant that schedule time was up the leader blew his horn and started his group immediately for the next orchard. On cross-roads men were stationed to direct the way to the next orchard. The schedules were so well worked out and maintained that at noon, or at the end of the day, the four groups met at a given point within 10 minutes.

One of the outstanding pieces of horticultural extension work during 1923 was the all-the-year garden con-

various women's clubs and civic organizations and through local leaders listed names of farmers, both colored and white, who were willing to enter the contest. Requirements for entering the competition were (1) that at least two vegetables should be produced in the home garden every month in the year, and (2) that the home demonstration agent in each county should submit to the extension office a statement showing the value of products of these gardens on an acre basis. A record card and one or more photographs (size 8 by 10

inches) of the gardens were also required.

Three sets of prizes valued at about \$300 were provided by agricultural papers, seed firms, merchants' associations, and other organizations in the State. The first series, of five prizes, ranging from \$50 down to \$1, was awarded to home demonstration agents in the State who turned in the highest percentage of completed record cards, this percentage being based on the number of farms in each county competing. The second series, of 11 prizes, ranging from \$25 down to \$1, was awarded to county councils, composed of representatives from all women's clubs in the county, which rendered the greatest amount of support to the contest in their county. The third series of three prizes, ranging from \$25 down to \$10, was awarded to individual gardeners for the three best all-the-year-round gardens in the State.

During 1923 there were enrolled 5,000 white families and 5,000 negro families in this contest. The contest lasted from February 1, 1923, to January 31, 1924, these dates having been selected on account of seasonal conditions in the State. As a demonstration, the all-the-year garden in Mississippi was so satisfactory that a much larger number of families is expected to undertake the work in 1924. The plan is considered applicable to all South Atlantic and Gulf Coast States, and with certain modifications, such as addition of coldframes and hotbeds, to many Middle and Northern States.

Special campaigns to promote and encourage the planting of home gardens were conducted from time to time in a number of States. The usual method of conducting such campaigns is through the local press, the material being prepared by the extension horticulturist and then given a local touch by the county agent. Special "garden weeks" or "garden days" are sometimes observed throughout a State. Landscape gardening was a topic for discussion in many women's clubs, and special meetings were sometimes held to see demonstrations started.

ILLUSTRATIVE MATERIAL

Extension horticulturists in fruit work use photographs, charts, slides, and motion pictures freely at gatherings of all kinds, and some States are well equipped with such material. These drive home the lesson better

than words, and rank next to the use of actual objects in demonstration work. Charts are used for presenting statistical matter at meetings, and at outdoor meetings are tacked up on the side of a building, or supported in other ways, while speakers discuss the points they are endeavoring to emphasize. Enlarged photographs showing series of pruned trees, crops from sprayed trees, planting of young trees, or other topics of interest are used for both indoor and outdoor meetings. Lantern slides are part of the regular equipment for illustrating lectures on practically all fruit, vegetable, and landscape topics.

In vegetable work extension horticulturists are moderately well provided with illustrative material, including charts, enlarged photographs, and lantern slides. The Department of Agriculture has excellent collections of slides bearing on various truck crops, which are lent to extension horticulturists and to county extension agents. On farmstead improvement there are available in the United States Department of Agriculture bro-mide enlargements and lantern slides showing contrasts due to successful planting.

INSTRUCTIONAL MATERIAL

Instructional material is usually issued in printed bulletins or mimeographed form whenever instruction is needed by county extension agents, demonstrators, or those adopting demonstration practice. This material gives explicit information on how and when to carry out all details of the subjects in hand. An extension horticulturist who has his work well in hand has printed or mimeographed matter on most of, if not all, the lines of work in his projects. Such material is of great value also in working up sentiment on problems not yet started in a community. Illustrations and drawings are used to advantage as part of this instructional material.

PUBLICITY

Information on results of demonstration work is given publicity in many ways, such as through the county and State press, extension department and county extension agent news service, personal letters, circular letters, slides, photographs, motion pictures, exhibits in show windows and at community, county, and State fairs, meetings, automobile tours, telephone, and radio. Extension horticulturists,

county extension agents, and others interested either write up news regarding such work or give facts to an editor to be shaped into attractive form.

CAMPAIGNS FOR PROMOTING IMPROVED PRACTICES

Extension horticulturists know that human nature is forgetful and that evidence of improved practices in the fall may be forgotten by the next spring when they should be started. To keep the subject before the public an intensive campaign of publicity is begun and continued several months before actual demonstrations are held, as was done in Kansas, where it was decided to put on an orchard clean-up campaign in the spring of 1923 in each fruit-growing county. During the fall, winter, and spring this orchard clean-up project was boosted at every extension meeting or gathering of people in the orchard counties. In addition, during the whole time, press articles, news-letters, and circular and personal letters emphasized the orchard clean-up campaign. Exhibits featured it, and people with orchards became convinced that the orchards must be cleaned up. In the spring the extension horticulturist and county extension agent held orchard clean-up, pruning, and spraying demonstrations in each county. The people responded enthusiastically, and the orchards were cleaned up.

LOCAL COMMITTEES AND LOCAL LEADERS

Not all counties are organized on the committee basis, but in those so organized, extension horticulturists find it easy to get work started and to keep it going. In the community organization, if fruit, vegetable, or landscape work is desired, a local committee is appointed to work with the county committee on the same subject. At a meeting of the county extension agent and county and local committees, with or without the extension horticulturist, the lines of work for each community are selected. The next step is to choose the local demonstrator or project leader. The extension horticulturist may then train the county agent, chairman of the county committee, and demonstrator, so that they are competent to conduct the demonstration in his absence. This training of leaders within the county is becoming more and more a duty of the extension horticulturist, while it

relieves him of much of the manual labor of demonstrations and enlarges his field of usefulness.

WORKING WITH EXISTING ORGANIZATIONS

Extension horticulturists work with existing organizations such as the grange, the gleaners, farmers' clubs, and any others interested in horticulture. In counties without county agents these organizations frequently form the point of contact between the extension horticulturist and the county.

SPECIAL ORGANIZATIONS

Extension horticulturists organize special associations for definite purposes as the demand arises. In several States cooperative fruit growers' grading and packing associations were needed; and after a year or two of propaganda by means of meetings, circular letters, press articles, and the like, extension horticulturists and county agents organized such associations. Extension horticulturists drew up provisional suggestions, constitution, and by-laws, assisted in incorporating associations, furnished instructions for grading and packing, and helped to get associations on a working basis. The associations have been of great benefit in getting men to work together, in establishing grades and packs of fruit, in keeping inferior fruit off the market, and in obtaining higher prices for the fruit marketed.

The organizing of orchard spray rings and the operating of spray service have been among the outstanding features of fruit demonstration work. Many hundreds of spray rings have been organized throughout the States and are the salvation of farm orchards. Thousands of commercial fruit growers are now depending upon the spray service furnished by various States. The spray ring and spray service have now been extended to vegetable growers.

In the work in ornamental horticulture, local demonstration clubs have been used among women and girls, and special clubs have been formed for flower growing. The work in ornamental horticulture is most successfully done where county extension agents, especially home demonstration agents, are trained by specialists. This is particularly true when emphasis is placed upon doing part of the work on a farmstead during any one year, as planting some shrubs

about the foundations of the house. The need for the future is the complete development of a few well-selected farmsteads to serve as demonstrations for their communities. In all cases it is important that the work done be of such nature that it can be followed easily by farmers in general. Plantings employed in demonstrations should be of a simple nature adapted to the locality and should include mainly those plants that grow naturally in the locality. Work should be undertaken only where it can be supervised effectively by county demonstration agents who have had some training along such lines.

THE EXTENSION HORTICULTURIST AND COUNTY EXTENSION AGENT

The most friendly and cooperative spirit exists between extension horticulturists in fruit work and county extension agents. Most extension horticulturists say that work within the counties belongs to county agents and that it is the extension horticulturist's job to help them in every way. The extension horticulturist assists the

merly to conduct work in counties where it can not be adequately supervised by these agents. Work is being conducted in a few counties without county extension agents, but is under the direction of a strong organization of growers. With landscape extension horticulturists there is frequently too much tendency to work directly with demonstrators, although contacts are made through a county extension agent.

HORTICULTURAL WORK OF COUNTY EXTENSION AGENTS

County extension agents are doing a vast amount of horticultural work with or without the aid of extension horticulturists, as the figures in Table 1 show. Not all the demonstrations started were completed or carried through the season, and a final report was not made on all completed work. The table gives statistics regarding demonstrations started, demonstrations completed, and acres involved. It should be noted that the number of county extension agents reporting is different in each case.

TABLE 1.—*Summary of horticultural work done by county extension agents, 1923*

Kind of demonstration	Adult demonstrations started	Agents reporting	Adult demonstrations completed	Agents reporting	Acres in completed demonstration	Agents reporting
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Tree fruits.....	21, 872	1, 301	16, 362	1, 304	87, 964	1, 116
Bush and small fruits.....	7, 088	568	4, 985	473	4, 601	299
Grapes.....	5, 554	615	3, 871	498	3, 450	286
Market-gardening, truck, and canning crops.....	22, 230	649	14, 320	544	19, 382	343
Home vegetable gardens.....	56, 035	704	37, 725	593	3, 696	254
Beautifying home grounds.....	31, 658	634	20, 003	495	724	146

county agent in planning and arranging his program and in selecting demonstrators and committeemen and arranges his trips to the county so as to give timely aid in conducting demonstrations. He trains the county agent and other leaders to handle demonstrations when he can not be present. It is noticeable that extension horticulturists are doing little personal service in the counties, but are working almost exclusively with county agents in counties having agents.

Extension horticulturists in vegetable work are for the most part working through county extension agents, and there is less tendency than for-

In 1923, county extension agents reported 6,101 boys and girls doing club work with tree fruits, 4,011 doing club work with bush and small fruits, 2,062 doing club work with grapes, 16,181 doing club work with truck and canning crops, 46,425 doing club work with vegetable gardens, and 26,154 doing club work with flowers, shrubs, and home grounds. Not all of the agents reported on the value of crops produced by club members, but the 1,025 agents who did report gave \$760,302 as an estimate of the total value of crops grown by their club members.

Due to the efforts of 1,866 county extension agents in working with

adults and juniors, the method of caring for tree fruits was improved on 134,109 farms, and 1,221 of these agents reported that 564,374 acres were involved in their work. In the care of bush and small fruits, 825 agents brought about better methods on 23,135 farms, and 371 of these agents reported 16,934 acres involved. With grapes, 873 agents reported improved practices on 28,947 farms, and 359 of these agents stated that 92,422 acres were involved. In growing truck and canning crops, 853 agents brought about better practices on 47,228 farms. Vegetable gardens were improved on 89,156 farms, due to the efforts of 978 county extension agents. Home grounds were improved by the planting of flowers or shrubs on 47,416 farms, through the influence of 793 county extension agents.

In both adult and junior work, 1,342 county extension agents caused better pruning of fruit trees on 65,878 farms; 267 agents caused better pruning of bush fruits on 6,493 farms; and 465 agents caused better pruning of grapevines on 17,964 farms. Better spraying or other control measures against fruit-tree pests were adopted on 80,884 farms as a result of the work of 1,453 agents; 332 agents caused better control methods against bush fruit and small fruit pests to be adopted on 10,112 farms; 388 agents established better methods in controlling grape pests on 10,619 farms; 404 brought about better control of pests on 13,579 truck farms; and 494 brought about better pest control in vegetable gardens on 24,548 farms.

OUTSTANDING RESULTS

A few big pieces of fruit work stand out above all the rest. Some of the specialists have the right idea of attacking an important State problem in a big way and making headway with it. The extension horticulturist in Michigan determined that fruit trees and bush fruits needed plant food more than anything else, so he interested the county agents in 23 counties to start fertilizer work, and in 1923 added several more. Practically all of the different fruits are included, and splendid results have been obtained. County agents entered into the project enthusiastically, and some of them have fertilizer demonstrations going on on 20 or more farms. (Fig. 6.) Most of the results were extremely satisfactory and convincing to the hundreds of fruit growers who

visited the demonstrations during the season. One county agent, who had no previous experience with commercial fertilizers on fruits, was afraid to apply more than half of the amounts recommended, so did not get good results. This one line of fruit demonstrations was worth thousands of dollars to the fruit growers of the State.

In one demonstration, nitrate of soda increased the crop 63 pounds per tree on sour-cherry trees 8 years old. One block of 400 fertilized sour-cherry trees of this age produced a net profit of \$102 over unfertilized trees, and the trees are in a much better condition for bearing future crops. In this State the quantity of nitrogenous fertilizer used for fruits increased in two years from 100 to 2,500 tons. In one county this increase in two years was from one-half ton to 90 tons. Throughout the entire country fertilizer demonstrations with fruits are one of the leading lines of work, with nitrogen as the element giving best results. The usual benefit of the use of nitrate of soda on apples is 1 bushel of fruit for each pound used. Thus, the average amount of 5 pounds of nitrate of soda per full bearing tree usually results in an increased yield of 5 bushels of apples.

Pruning fruit trees is the most widespread of any line of fruit demonstration work, and some results are almost spectacular. In Oregon and Washington from 75 to 90 per cent of the commercial fruit growers in the principal tree-fruit sections have adopted the high-renewal system taught by extension horticulturists. In one section 20 professional tree pruners were told by the fruit-growers' committee that if they did not adopt this approved practice their services would no longer be needed. They demurred at first, but soon became boosters for the new system. In California in 1922 this approved type of fruit-tree pruning was reported to have increased the value of the fruit crop over that of the previous year by \$7,000,000. Apricot trees pruned by the high-renewal system yielded more than twice as much, and peach trees pruned in the same way yielded three times as much as trees pruned in the old way.

The subject of spraying fruits is as important and widespread as fruit pruning, but not so many demonstrations were reported by the fruit specialists. This is in part due to the fact that commercial fruit growers are usually well trained in spraying and receive the spray service by telephone

relay systems and by mail. The outstanding thing in spraying is the formation of orchard spray rings in many States. These spray rings are cooperative associations of 3 to 20 owners of small orchards. Each spray ring provides itself with a power sprayer or barrel pump, according to needs, and hires a member or an outsider to do the spraying. The cost of sprayer and materials is prorated among the members in proportion to the number of trees each has to spray and varies from about 65 cents to \$1.25 per tree per season for materials, labor, and overhead expenses. These orchard spray rings are the salvation of farm orchards and solve one

Orchard spray rings are organized to meet best the needs of members. There is no standard form of organization. If only three or four neighbors wish to organize a spray ring the county agent or extension horticulturist advises them to enter into a cooperative agreement, usually verbal, to purchase a barrel spray pump and spray materials. The expense of the pump is shared in proportion to the number of fruit trees each member has to spray. The county agent or extension horticulturist estimates the amount of spray materials to purchase and outlines the spray schedule. One of these men is usually present to show how to prepare the spray



FIG. 6.—Demonstration being conducted by extension workers in an apple orchard to show the advantages of using fertilizer. The fertilized acre on the right yielded 157 barrels of apples, whereas the unfertilized acre on the left yielded 87 barrels—a gain of 70 barrels with an expenditure of only \$15 for fertilizer. (Photograph furnished by Connecticut Extension Service)

of the most irritating problems of farm work—that of getting the orchard sprayed.

The orchard spray-ring idea originated in Iowa, where one ring was organized in 1919. Iowa reported 64 new orchard spray rings organized in 1923 and a total of 499 in operation, of which 191 used power sprayers and the others used barrel pumps. The idea has spread to other States, and many of them have spray rings in successful operation. In at least two States spray-ring organizations have marketed surplus fruit crops of their members. Members of one spray ring rented a storeroom in town and held fruit sales every Saturday until the surplus was sold.

material and how to spray thoroughly. Members either select one of their number to do all the spraying or pass the pump around so that each may do his own spraying. Orchards should be near each other, so that little time will be lost in going from one to another.

With the larger spray rings consisting of 6 to 20 members, the extension horticulturist and county agent canvass the situation and advise prospective members as to the kind of spray outfit to purchase and the form of organization to adopt. Usually the constitution and by-laws are provided by the extension horticulturist. A power sprayer is advised for this type of spray ring; and the expense of it is

prorated among members, who may either raise the cash at once, issue shares of stock, or sign a joint note and borrow the necessary amount from a bank. The prorating is done according to the number of fruit trees each member has to spray. A power sprayer which will take care of 750 to 1,000 fruit trees will cost about \$250, and thus the expense to each member in the ring will be less for equipment than if he purchased a hand pump for his individual use.

The constitution and by-laws provide for a president, vice president, and secretary. Usually, either the president or secretary is designated as manager, and it is his duty to purchase the spraying outfit, the spraying materials and supplies, and to have charge of operating the spray outfit. He either does the spraying himself or arranges with another member or some one outside the ring to do it. He keeps a record of the total number of gallons of spray mixture used and of the gallons used on the trees of each member, and from the total of all operating costs determines the cost per gallon and thus figures the amount to be paid by each member. The expense of spray materials and the cost of spraying with power sprayer usually amount to 65 to 80 cents per tree for the season. The expense per tree per season for materials and cost of spraying with a hand pump may run as high as \$1 to \$1.25.

Occasionally, a board of three directors is elected which purchases materials, makes assessments, employs a man to do the spraying, and attends to the business of the spray ring. About 10 members make a good spraying unit; and the entire circuit of orchards ought not to be more than 10 miles. Larger numbers and more mileage are not so economical or satisfactory.

The results of spray-ring cooperative spraying are most remunerative. In one farm orchard in Connecticut last year the value of the crop from 43 apple trees was increased \$400 at a cost of \$92.06 for spraying. In Indiana the crop of a farm orchard of 30 trees was increased 140 bushels at a cost of \$28.34 for spraying. Scores of other results as good as these might be given.

Cover crops have been used in a limited way in eastern orchards for 25 years at least, but not half that long in western orchards. In the far West the orchards under clean culture year after year begin to decline be-

cause of lack of decayed vegetable matter in the soil. Experience proved that cover crops would restore the needed fertility and bring the orchard back into profitable production. Extension horticulturists in Oregon and Washington started demonstrations with phenomenal results, and many thousands of acres of orchards are now annually planted to cover crops. In some of the noted fruit sections 90 per cent of the orchards are now growing cover crops. These crops are valuable not only for the plant food they furnish, but since they should be allowed to grow all summer in irrigated sections, no orchard cultivation is necessary, and this big item of expense is eliminated. Orchard cover-crop demonstrations are increasing throughout the country, but the adoption of the practice is most outstanding in the far West.

During the past five or six years several Southern States have carried on important demonstrations with home orchards, these being conducted through a period of years, including the planting and bringing to maturity of the orchards. As a direct result of these home-orchard demonstrations, thousands of acres of peaches, apples, and pears are now being planted throughout the Southern States.

It would be difficult to enumerate and describe all outstanding pieces of work done with vegetables, but among those that might be mentioned is the work of vegetable variety and strain adaptation conducted by a number of the extension horticulturists. Demonstrations on improvement of soil fertility have also been of great importance. Along the South Atlantic coast extension horticulturists have aided materially in bringing the trucking industry to its present high standard. Development of the asparagus acreage of the Carolinas and Georgia is another outstanding piece of work. One of the most important demonstrations with vegetables during recent years has been in improved methods of harvesting and storing sweet potatoes. Formerly, a large part of the sweet-potato crop was lost for want of adequate storage facilities, and the market was supplied during a portion of the year only. At present the market is supplied abundantly throughout the year, and the sweet-potato industry has been placed on a profitable basis. Seed treatment, especially of potatoes and sweet potatoes, has given outstanding results in a number of States, the increased yield in many

places being as high as 30 or 35 bushels to the acre.

Demonstrations in proper use of commercial fertilizers in connection with the growing of truck crops have proved effective in a large number of States. An important phase of demonstration work with vegetables was that of potato-seed certification and the increasing of yields through use of certified seed, together with better planting and cultural methods. When one considers the enormous value of the potato crop, it can be readily understood that better seed and increased yields play an important part in economical potato production.

In Mississippi the landscape extension horticulturist working with extension agents developed demonstrations in more than half of the counties and brought about some planting on more than 4,000 farms. A home demonstration agent in Tennessee was able to get more than 100 women in her county to improve the appearance of the foundation of their homes.

COOPERATION WITH BUSINESS INTERESTS

There is a wide field of service for specialists in bringing fruit and truck growers and business interests together, as was done in Missouri, for example, in inducing druggists and merchants to carry stocks of spray materials and equipment at reasonable prices. Contacts are thus formed with manufacturers and dealers in all kinds of spraying materials, nursery stock, seeds, fertilizers, orchard machinery, barrels, and any other necessary supplies. The business interests should be advised as to the probable amount and kind of supplies needed. Ready-to-serve brands, as of spray mixtures, for instance, are desirable for many people who will not do the things it takes time or skill to perform. Druggists and merchants are given circulars of information on fruit and garden diseases and insects and methods of control. This, of course, is being done in cooperation with county agents who attend to details within the counties but do not become financial agents.

COOPERATIVE PACKING AND SELLING ASSOCIATIONS

As fruit and vegetable growing become more highly developed, cooperative packing and selling become necessities. This idea has been well worked

out in several States and has given satisfaction. In sections distant from good local markets the association method is one of the best means of putting honestly packed fruits and vegetables on the market.

Vegetable growers have recently become more inclined to avail themselves of the services of county agents and extension horticulturists in the matter of forming marketing organizations. While these officials do not undertake the business operation of a marketing association of this character, they do supply working plans and give advice to growers. This is one of the important fields wherein extension horticulturists and county agents can be of service to growers of their respective States and counties.

COOPERATION IN LOCAL FRUIT SALES

There is a big opportunity in helping to sell the farm orchard-crop surplus either at the farm or in the local market, and a project of this kind is worth while. Advertising by local papers, handbills, or road signs would direct the consumer's attention to the point of supply, and recipes on the preparation of fruits for serving would be helpful. Local merchants should be induced to handle good fruit only in convenient packages and at reasonable prices. Fresh supplies should be brought in only as fast as they can be sold. Assistance should be given merchants in advertising by variety names and in special uses of different varieties. In some places it would be practicable to rent a storeroom and sell fruit in quantity, as is now being done with citrus fruits. Special advertisements would bring crowds of purchasers to such salesrooms.

Roadside markets are becoming an important factor in local marketing of fruits and vegetables. While few specific demonstrations have been conducted to show the value of roadside markets, records of sales are used as a basis for extending this method of marketing fruits, vegetables, and other farm products. Some roadside markets are doing an annual business of \$30,000, and a business of \$10,000 a year is not unusual.

COOPERATION WITH NUTRITION SPECIALISTS

A big and useful field for extension horticulturists in fruit and vegetable work is opening in connection with activities of extension specialists in

nutrition who are attacking the food problems of farm and village people. These specialists know much about the nutritive value and digestive possibilities of fruits and vegetables and can recommend such combinations in the diet as will serve not only to assist very materially in preserving good health, but also to repair certain ills brought about by improper diet. In a number of States nutrition specialists are definitely recommending the use of at least one fruit and one vegetable, but preferably two fruits and two vegetables, in addition to potatoes or sweet potatoes in the daily diet. Food-selection demonstrators are being enrolled to provide these fruits and vegetables for their families. The food-preservation project is being preached as a systematic method of estimating the amount of fruits and vegetables that must be stored or canned to meet the needs of the individual family during non-producing months.

The fruit extension horticulturist can cooperate by advising the kinds, varieties, and number of plants of small fruits and grapes for the fruit garden and the way to plant, prune, cultivate, train, and care for them. The fruit garden is one of the most important items connected with the home. Tree fruits might or might not be included in the project.

Increased interest in the home vegetable garden has led several extension horticulturists to give more attention to this feature of vegetable work. One of the problems in this connection has been to plan the farm garden so that an adequate supply of fresh vegetables will be provided at all times of the year. This is especially true in the Southern States, where seasonal conditions make it difficult to keep the garden in good condition during midsummer, and in the Corn Belt States where specialized farming is so largely practiced. Among notable examples of methods adopted to accomplish this result might be cited the all-the-year garden contest followed in Mississippi, which has been previously described.

In the Corn Belt States, the plan has been to induce the farmer to plan his garden so that the work of preparing and cultivating the soil can be done with horsepower or in some cases with tractor power. Control of garden pests, though of greater magnitude than formerly, is being so simplified through the use of dust and special sprays as to bring it within the range of practical possibility.

There is need, however, for much additional work in encouraging farmers to provide gardens that will adequately supply their families with fresh vegetables. Further work is necessary to aid the people in proper preservation of summer-grown vegetables for winter use.

JUNIOR CLUB WORK

One of the greatest opportunities to do constructive work of lasting value is with boys and girls. Of the 11,000,000 farm boys and girls in the United States, slightly more than 450,000 are in club work of some kind. The club department should do the organizing and direct the seasonal operations through county demonstration agents and local leaders. State extension horticulturists should furnish subject matter and timely suggestions and give such personal attention to the project as time permits.

As a rule juniors do not care to wait long for financial returns, so the strawberry is the most promising fruit for club work. To prove the possibilities of this line of effort, we need only refer to the splendid work of Illinois last year in organizing 739 boys and girls into strawberry clubs planting nearly a quarter of a million plants. This is easily the most outstanding piece of small-fruit extension work during 1923 and might well be emulated in other States.

Orchard-club work should be greatly increased. Indiana has apple-club work well established in county agricultural high schools with 30 or more Smith-Hughes vocational teachers as club leaders. The work is handled in two ways, by class clubs using an orchard for each club, and by other clubs using home orchards individually. There are 18 class clubs using orchards containing 1,180 trees. All members of each club share in the work of the club orchard. In other clubs each member does his work on a few trees in the home orchard. There are 89 boys doing this home club work on 2,880 trees.

CONCLUSION

The outlook for fruit, vegetable, and landscape demonstration work is bright. Extension horticulturists are doing less and less personal service work and are settling down to long-time programs. They are realizing that they must handle big problems in a big way and thus accomplish

something worth while. They work for the most part through county agents in counties having agents and with county committeemen, local committeemen, and community organizations in unorganized counties.

This report is not intended to discuss all the points connected with fruit, vegetable, landscape, and related demonstration work, but rather to direct attention to some of the outstanding things being done and to other things which would be worth while doing. The richest field of all to enter is that of the approximately

10,550,000 farm boys and girls who are strangers to any kind of club work. There must be many among them who would fit perfectly into a fruit or garden club project. Closer cooperation with home demonstration agents and nutrition specialists in making better homes and better living is essential. Cooperation with business interests is necessary. The tackling of the vital problem in a big way is fundamental. We have the background of good work well done and the bright future of bigger things yet to be accomplished.

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